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others, which I must pass by with regret, but which the intelligent reader will easily find by his own observation. Many conclusions which escape us at present will be drawn from this theory, when economists shall have comprehended that the key of economic science is to be found in the analysis of landed property, and shall have consecrated to this subject the conscientious study which it deserves and for which it has waited from the time of the immortal works of Ricardo, of Wakefield, and of Von Thünen. Until then we shall have nothing but interesting scientific disquisition, which will glide with elegance over a narrow polished surface, without suspecting the existence of the mysterious depths and the vast abyss which lie beneath.

ACHILLE LORIA.

UNIVERSITY OF SIENA, ITALY, 1891.

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#### THE STATICS AND THE DYNAMICS OF DISTRIBUTION.\*

I am indebted to President Walker for his candid criticism of my theory of Distribution. It is based on certain misunderstandings that can be wholly removed by a more extended statement of the theory itself. What I have not made clear to my eminent critic is the fact that the study lately published in this *Journal* was essentially limited to the statics of the subject. Dynamic influences, such as those to which he calls attention, could not be studied in the same connection without defeating the purpose of the article.

By the term "static" there were designated, in the recent paper, certain forces that do not require any change in the structure of society in order that they may operate. Society is a thing of life and growth. It is in one condition to-day, and will be in a different condition a few years hence; but through the whole series of such changes certain forces will work. If we were to stop the evolution at any point and hold society for a decade in a stationary state, these perma-

\* Referring to an article on "Distribution as Determined by a Law of Rent," in the number of this *Journal* for April, 1891, which was criticised by President Francis A. Walker in the succeeding number.

inent forces would act through that period as they were acting at the moment of arrested growth. Other forces are dependent on change itself. They act transiently and often locally. As alterations are continually occurring in different parts of the social structure, dynamic forces are always in action; but each particular one acts briefly, and all would soon cease to operate at all if the form of the organism were to become fixed.

It was the aim of the recent study to isolate the static forces, and determine their separate effects. It will be the object of the later study to which in the article reference is made to isolate and separately measure the dynamic forces. A merging of both sets of influences gives a composite result in which it is impossible to clearly distinguish the effect of either. A failure to separate the two sets has baffled many a vigorous effort to attain the laws of distribution.

The method used in separately studying the static influences that determine the apportionment of the social income was the creation of an imaginary period in which they might have the field to themselves. In the words of the article:—

Five changes of social structure need to be excluded, if society is to be reduced to a static condition; and by a use of the scientific imagination we will exclude them, and create that state. These are: first, changes in the character of social wants; secondly, changes in the mechanical processes of production; thirdly, alterations in the mode of organizing industry; fourthly, shiftings of labor and capital from place to place within the system; and, fifthly, increase or diminution of the amounts of capital and labor in existence. The movements in which the dynamic quality of actual society consists would respectively be brought to a stand-still if we should in some way make human wants constant in character and degree, arts unprogressive, modes of organization stable, the magnitude of different industries normal and permanent, and the total amounts of labor and capital fixed. We must in this way create for our own purposes an imaginary state, in which for a time social forces and relations are stable. Yet we make in this way a study that is completely realistic, since the static forces are dominant in the world of actual business. We isolate them, in order that we may know their nature. In the end,—though not in this article,—we shall take account of all essential changes that in reality take place, and attain the dynamic laws of distribution.\*

\* Page 290 of Volume V. of this *Journal*.

If the full scope of the changes here specified be realized, it will be seen that the influences to which President Walker calls attention fall within the enumeration. They are, for a purpose, excluded from the present field of view. To have traced the parallel enlargements that actually take place in the working force and the capital of the world would carry the inquiry prematurely into the dynamic division of the subject; and to have inquired whether these two movements make general industry more fruitful would have transferred the study to the department of production.

It is a part of the theory advanced that "pure profit," or that which a business man gains over and above all reward for his personal labor and his capital, is dynamic in its origin. It comes into existence after one or more of the changes above cited. I cannot here undertake to prove the correctness of this view: some proof of it was given in an earlier study.\* If the view is correct, pure profit would not exist under static conditions. In any case, the treatment of this element, the importance of which the writer would estimate as highly as does his critic, was expressly deferred, in order that it might be included in the part of the theory that is to deal with distributive dynamics. The remaining or static shares of the social income are the earnings of labor and those of the instruments of production—the tools, materials, land, etc.—that may be grouped under a comprehensive use of the term "capital." If social progress were to stop, men would still work and use land and tools. Wages, on the one hand, and the interest on all productive wealth, on the other, absorb the static part of the social income; and this is the whole of the income existing in the case that we now study.

The theory maintains that wages and interest are in their nature surpluses, or differential gains akin to the rent of land. For a special purpose they were provisionally termed rents, though it may well be that in the end another term will be used, as indeed the article itself intimates. It was desirable, in demonstrating the nature of wages and interest, to use a

\* In a book called *The Modern Distributive Process*, by Giddings and Clark, and earlier in the *Political Science Quarterly*.

familiar Ricardian formula; and this could best be done by keeping the traditional term.

The familiar mode of showing that the rent of land is a differential gain is to take a field so large that, in practice, it would be tilled by a number of men, and then in imagination put the men into it, one at a time. The first man then produces more than the second, the second more than the third, while the last man produces less than any of the others. Each man gets in wages as much as the final man produces. The surplus that each of the earlier workers creates, over and above his wages,—or over and above the product created by the final man,—goes to the landlord. The rent of the field is the sum total of these surpluses created by the earlier workers in the series.

Now, the rent of a field is a static income. It would continue forever if the field were always to be tilled by a fixed number of men under otherwise stable conditions. The land of the world that now yields a rent would continue to yield it if the population of the world were to stop increasing and migrating. Yet the Ricardian way of demonstrating the nature of such a rent would be to introduce a bit of imaginary dynamics. Introducing men into a field one at a time is going through a rapid succession of imaginary changes in this industrial group, for the sake of understanding the character of that static condition to which such a series of changes would lead. It is the static element, the rent that the field affords when tilled by the full number of workers, that is from the first the subject of the study. The imaginary changes that reveal the nature of this income are not to be confounded with the actual enlargements of population that take place in the world.

In the ideal case, the enlarging force of men in a field of limited size is subject to a law of diminishing returns. The products created by the workers diminish in the order of their supposed arrival. For a field limited in extent substitute a capital, in land and other things, that is fixed in amount, and is used by more and more workers, and the same law will operate. The increasing labor force will get diminishing returns. The first man will produce more than the second,

and the last man will create the least of all. The sum of the surpluses created by the earlier men, over and above the standard furnished by the last, is the total rent of the fund of capital. In short, all that in the current Ricardian formula is asserted of a limited area tilled by an enlarging force of men is true of a limited equipment of productive wealth in all its forms, utilized by a similar enlarging force. In a static condition, capital, like land, earns a surplus, or a sum of differential products.

In a static condition, labor earns a similar surplus. We prove this by changing the bit of imaginary dynamics that in the former case led up to the stationary state. We leave the working force fixed in amount, and introduce units of pure capital one at a time. These units of capital now get diminishing returns. The first creates more and the last creates less than any of the others. Each earlier unit produces a surplus over and above what is created by the last, and the sum of these surpluses is the total product of the labor. Wages are in their nature akin to rent.

If both of these agents of production were to continue forever unchanged in amount, both would earn rents. There would be no actual enlargements of either to suggest the nature of these surpluses; but the nature of them could be demonstrated by going through the imaginary operation of introducing first one agent then the other into the field by gradual enlargements, leaving the companion agent, in each case, fixed in amount.

President Walker finds a formal error in the supposition that the law of diminishing returns operates from the beginning. Two men in a large field would produce more than twice as much as one, since they would join forces and introduce division of labor. The case would show an early period of increasing returns.

The failure to recognize such an early period has, of course, only a formal importance, since the applications that are to be made of the law are confined to later periods; but would there be any such period *in the assumed conditions?* The combination and division of labor to which the increased returns are attributed constitute a dynamic influence that is not

recognized in the supposed case. It is expressly excluded from the conditions of the ideal society that we create. The transition from a state in which one man works alone to a state in which two work together and exchange services or products means a more radical change in the constitution of society than can ever be made at a later date. It falls under number three in the list of dynamic influences that are specified and that are supposed, for the time being, not to operate.

In an actual society, with a fixed area of land and an enlarging population, the law of diminishing returns would be concealed during the earlier stages of growth. The effects of it would be more than counterbalanced by those of another influence, namely, organization. The concealed effects would exist even in that case. The resultant increase in the productiveness of industry due to organization would be less than it would have been if the product had not been reduced by incipient world-crowding. Two opposite influences—organization, which enlarges the product, and incipient pressure of population on the soil, which reduces the product—are, in primitive societies, in action together. The greater force conceals the action of the smaller. The resultant of the two forces is an increase in production. The smaller force is not absent because its effect is disguised. In our assumed case we have stripped off the disguise. We exclude the action of the second dynamic influence, organization, and let the world-crowding reveal its full effect.

In the effort to give to a new and comprehensive theory a condensed statement, some misunderstandings were nearly unavoidable. The particular misunderstanding that is the basis of President Walker's chief criticism is radical and unexpected. He attributes to me a view that I should condemn in sharper terms than, in his considerate comment, he has chosen to use. This view is that capital and labor may increase together, and that both may, during the process, create diminishing returns. He questions the correctness of the view that, as he expresses it, "both capital and labor are, in their general course, subject to a law of diminishing returns"; and the context shows that the general course referred to is the increase of both of these agents that is actually taking place in the world.

He asks how it can be that "two forces, each of which, by the very nature of things, acts, as it progresses, at a diminishing rate, shall yet, by being compounded, produce results which not only do not diminish, but actually increase from term to term." It certainly cannot be. The static income that is under consideration is the sum of wages and interest, and the components cannot be reduced without lessening the sum. Under the circumstances the components would not diminish.

I have not said that labor and capital simultaneously create diminishing returns. What was said in the recent article was that, if labor increases *while capital remains fixed in amount*, the labor will create a diminishing product. It was also said that, if capital increases *while the working force remains fixed in amount*, the successive increments of capital will create lessening products. The law operates when the relative amounts of the two factors of production change. A proportionate increase of both factors annuls that condition. If capital and labor increase together and at the same rate, they will get stationary returns: each man will find his wages unchanged, and each dollar's worth of invested wealth will show, in so far as this influence alone is considered, an unaltered gain. If both agents of production increase, but at different rates, the effect will be the same as if one were fixed in amount and the other increased more slowly. The one that increases relatively to the other will experience a diminution of its product. A simultaneous reduction of both products from this cause is impossible. I am happy to regard what President Walker has said on this point as re-enforcing my actual theory rather than as opposing it.

Conceding that two men with one spade between them would do less than twice as much as one man with one spade, my critic inquires why, in the illustration, we do not "let each man have a spade to himself, and then inquire whether the per capita product diminishes as the number of laborers increases." The answer is now plain. The illustration suggested would not have revealed the nature of rent. We are studying the surplus created by a fixed amount of capital when used by a fixed number of men. The Ricardian mode of analysis goes through an imaginary process of introducing

the men one at a time. Introducing both agents gradually and at a uniform rate would not reveal the nature of the surplus. It is necessary to call attention to the fact that in the recent article the illustration actually used was not that of an enlarging number of workmen using one spade. That would indeed have been a "much wronged" implement. The men were made to use a fixed amount of "pure capital"; but the forms of the capital were diversified according to the workers' needs. If the first man had one good spade, the two men who followed him would have two cheaper and less efficient implements, representing a like amount of invested wealth. The per capita returns would then be reduced.

President Walker inquires why, as labor and capital actually increase together, we should not

hope to discover a great deal more of the truth of the matter by assigning to each laborer a spade, an axe, a hammer, a loom, or a fishing-rod, according to his avocation, and then ask whether, aside from the effects of diminishing returns in agriculture, due to the chemical limitations of the soil, an increase of labor (properly distributed over all the avocations practised in the community) will result in a diminishing or in a stationary or in an increasing per capita product?

In so far as diversifying the forms of the capital is concerned, our inquiry has taken this element into account. We proposed to give to our workers implements as well adapted to their needs as was possible without a change in the total amount of invested capital. An inquiry concerning certain things that will happen if the amount itself shall increase will be germane to the later study referred to. That study will range over a still wider field, and consider the effects of organization and mechanical invention. It will aim to follow the effects *on distribution* of all of the greater dynamic influences that will act in that unified workshop of the future into which the world may resolve itself. It will not study the effect of those influences on production as such. Though evolution should change the earth into a paradise for productivity, there must always be a division of a certain part of its fruits between labor and capital. That division must be effected by static law. It will conform, as the recent study

would claim, to the principle of differential gain that is at the basis of the Ricardian law of rent. In the process of attaining that law we cannot study the great dynamic influences. In general, these influences make the social dividend larger, leaving the relative amount of wages and interest to be fixed, as long as competitive law shall rule, in accordance with the principle that we have analyzed.

In the traditional order of inquiry, a study has been made of the relation between labor and capital on the one hand, and land on the other. During a century of vigorous scientific work this mode of research has not afforded a law of wages and interest that has met with general assent. The rates of wages and interest depend, not on the relation of labor and capital to land, but on the relation of labor to land and all other capital. The demarcation to be made is between man and his whole instrumental environment. If the labor factor shall outgrow the environment, it will suffer in the apportionment. Dynamic influences may then do their best to make industry fruitful: we shall still hear of the claim of a laborer to a *relatively* larger share of the social income. In this view, it will hardly suffice to recognize the fact that labor and capital increase, in a general way, together. The two rates of increase cannot be equal, and the difference may be of vital consequence. On the relative rapidity of the growth of capital and labor depends the ethical quality of future distribution.

J. B. CLARK.

NORTHAMPTON, MASS.